"Key" Track Analysis

Hypothesis: A track fit in the SFT which is linked to the DCs and segmented by SFT station will point to the found emulsion vertex within track fitting errors and free of systematic effects

Method: Use the set of located *and* refit events. Project final, segmented tracks to z_{vtx} and find the *u,v* (transverse) distance to the true location. Muons are especially valuable.

"Key" Track Analysis

Expected Errors: Track-fitting errors should dominate over multiple scattering for $p > 2$ GeV/c. The uncertainty in the projected coordinate depends on the number of SFT hits $\Rightarrow$ the error may depend on the module containing the vertex.

Projecting to module center in z ($\sigma = 180\mu m$)

$\sigma_{u,v} = 370\mu m$ for Stations 2 & 4 (13 planes)

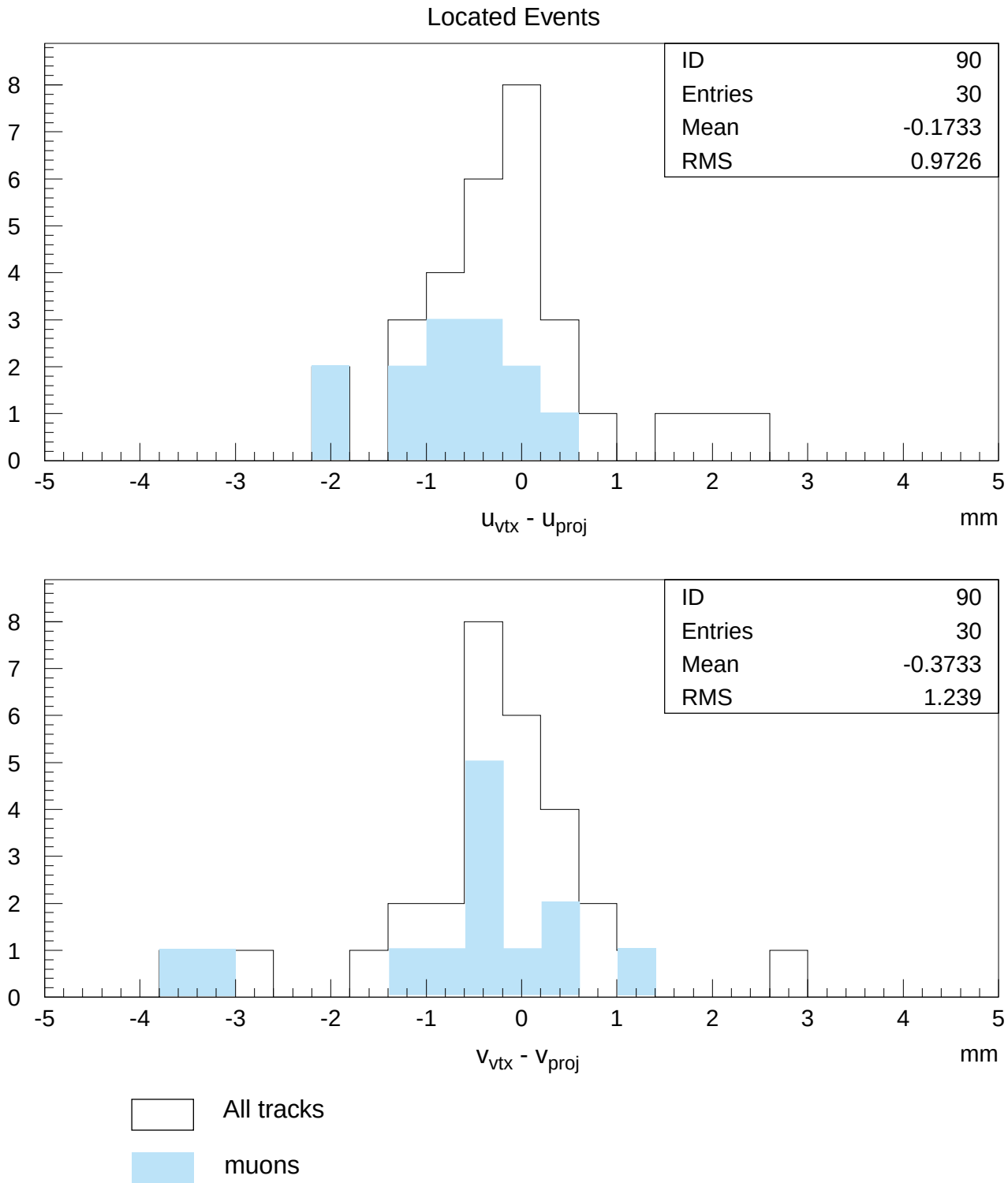
$\sigma_{u',v'} = 2.2$ mrad

$\sigma_{u,v} = 570\mu m$ for Stations 1 & 3 (9 planes)

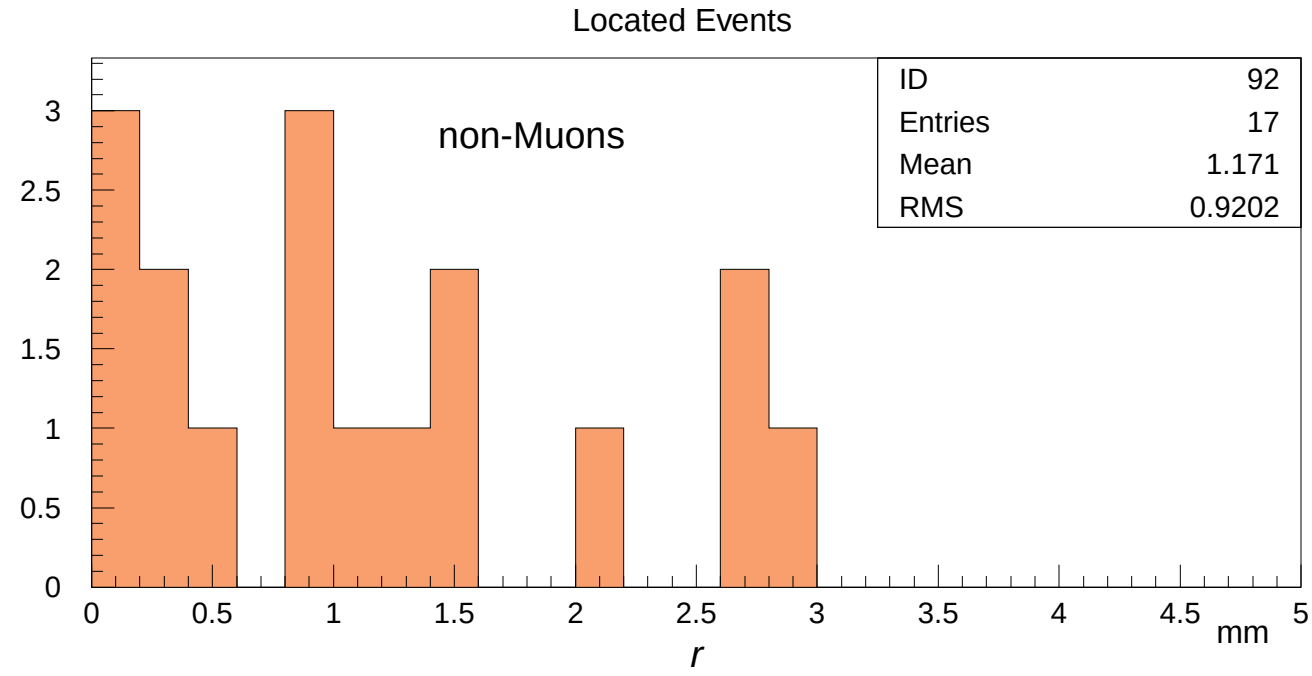
$\sigma_{u',v'} = 3.8$ mrad

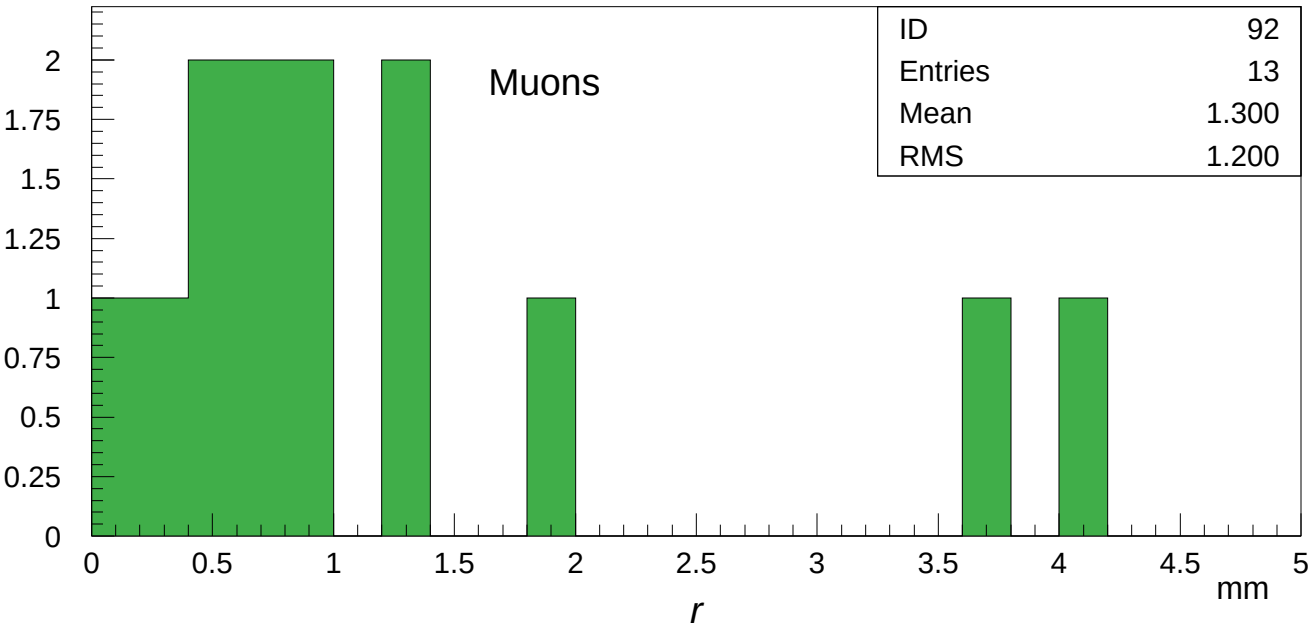
Missing two hits inflates the errors by about 20%.

Distance between emulsion vertex *u,v* and projected track from SFT

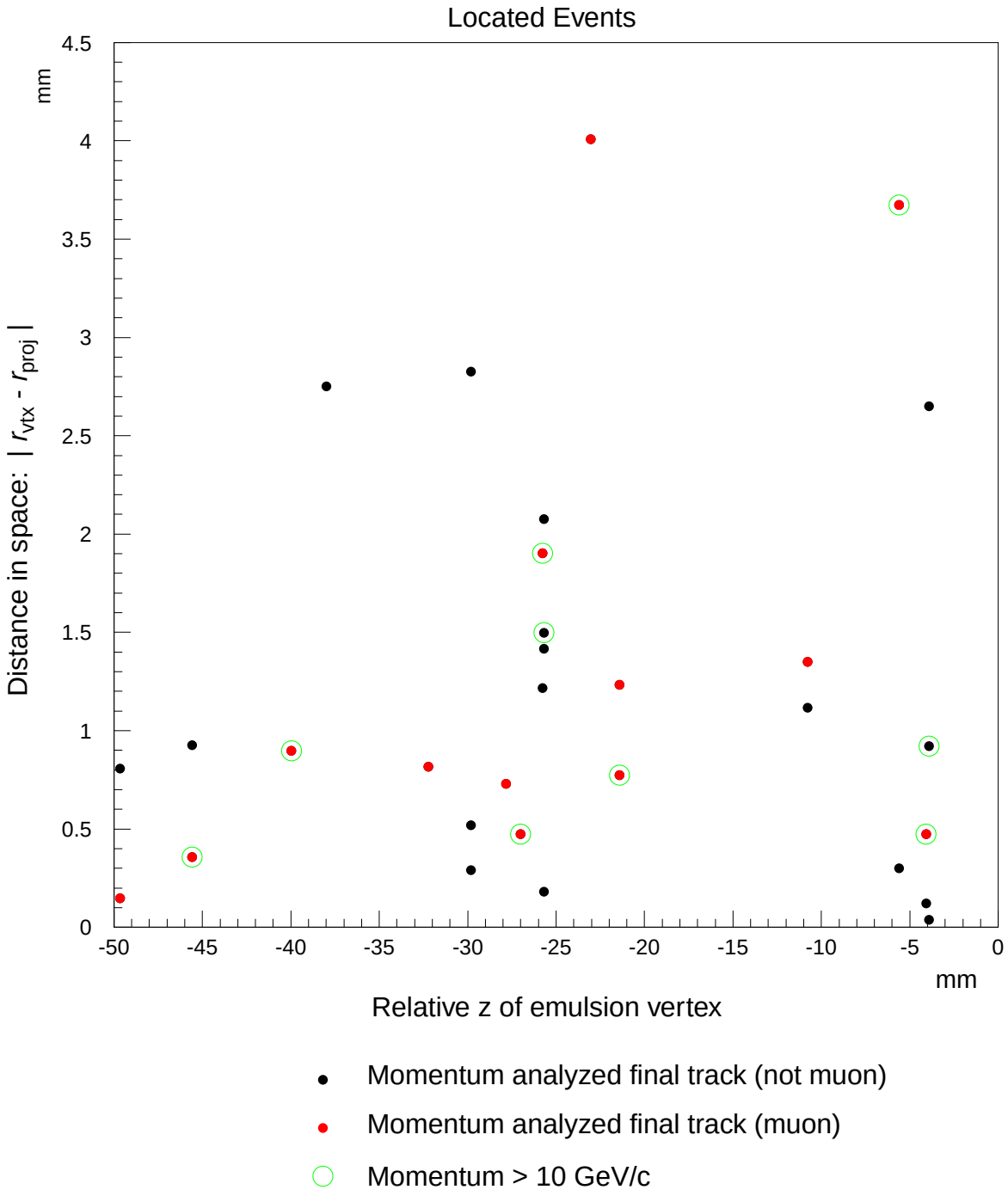


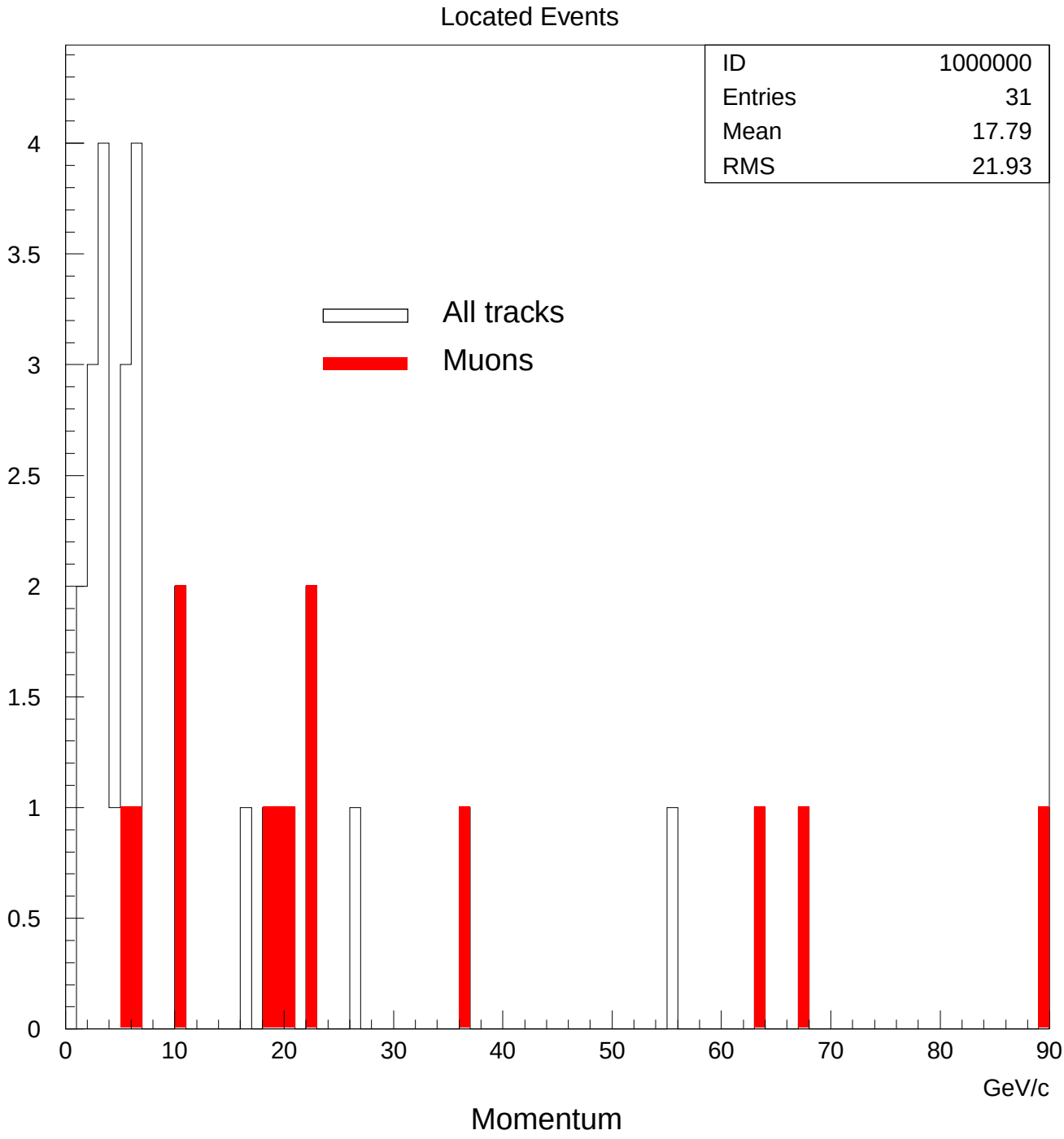
Distance between emulsion vertex, *r,* and projected track from SFT





Distance between emulsion vertex, *r,* and projected track from SFT, combining data from all 4 modules




Located Events
ID 1000000
Entries 31
Mean 17.79
RMS 21.93
All tracks
Muons
0
0.5
1
1.5
2
2.5
3
3.5
4
0
10
20
30
40
50
60
70
80
90
GeV/c
Momentum

Distance between emulsion vertex, *r,* and projected track from SFT